

adapters 10, 170 can be amply secured to boss 24, 171 by a rigid lock without an adjustment assembly (not shown) that simply prevents forward movement of the adapter. Under these conditions, the lock member and corresponding opening would be essentially the same as discussed in U.S. Pat. No. 5,088,214 to Jones, which is hereby incorporated by reference. An example of such an adapter 10' is shown in FIG. 13. Nevertheless, a lock without an adjustment assembly could still be used in openings 76, 195.

The above-discussion concerns the preferred embodiments of the present invention. Various other embodiments as well as many changes and alterations may be made without departing from the spirit and broader aspects of the invention as defined in the claims.

We claim:

1. A wear assembly for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear assembly comprising:

a boss having a first surface adapted to be fixed to the digging edge, a second surface adapted to be positioned remote from the digging edge and having a T-shaped structure, and a bearing face extending between said first and second surfaces;

a wear member having at least one rearwardly extending leg and a forwardly projecting working end, said leg having a T-shaped structure releasably coupled to said T-shaped structure of said boss, said leg further including an opening extending therethrough; and

a rigid lock received into said opening, said lock having a first face adapted to oppose and engage said bearing face of said boss and a second face adapted to oppose and engage a wall of said opening whereby said lock secures said wear member to said boss, said lock further including an adjustment assembly selectively movable to vary the relative positions of said first and second faces to eliminate looseness which may exist in mounting said wear member to the digging edge.

2. A wear assembly in accordance with claim 1, in which said opening has a generally T-shaped configuration with a stem portion that extends longitudinally and opens in said rear end and a lateral cross portion which includes said wall to oppose said lock.

3. A wear assembly in accordance with claim 1, in which said lock includes a body and said adjustment assembly includes a threaded bore extending through said body and a threaded plug operatively received into said bore, wherein said plug includes the first adapted to engage said bearing face of said boss.

4. A wear assembly in accordance with claim 1, in which said lock includes a body and said adjustment assembly includes a bore extending substantially through said body and a piston axially movable in said bore under fluid pressure, wherein said piston includes the first face adapted to engage said bearing face of said boss.

5. A wear assembly in accordance with claim 1, further including a deflector fixed to the digging edge rearward of said boss, said lock member being positionable between said deflector and said wear member to move said adapter forwardly along said boss upon advance of said adjustment assembly.

6. A wear assembly for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear assembly comprising:

a boss having a first surface adapted to be fixed to the digging edge, a second surface adapted to be positioned remote from the digging edge and having a T-shaped structure, and rear and front bearing faces extending between said first and second surfaces;

a wear member comprising a rear mounting end and a forwardly projecting working end, said working end

having a longitudinal axis, said mounting end including a leg having a longitudinal axis inclined relative to said longitudinal axis of said working end and adapted to extend rearwardly over the digging edge, said leg having an inner surface adapted to face the digging edge and a T-shaped structure extending longitudinally along said inner surface for coupling to said T-shaped structure of said boss, a bearing face extending transversely to said T-shaped coupling structure and generally perpendicular to said longitudinal axis of said working end whereby said bearing face abuts said front bearing face of the boss, and a lock receiving opening extending through said leg and in communication with said T-shaped structure of said wear member; and

15 a lock received into said opening to oppose said rear bearing face of said boss and a wall of said opening to thereby secure said wear member to said boss.

7. A wear assembly in accordance with claim 6, in which said working end includes a nose for mounting a point of an excavating tooth.

20 8. A wear assembly in accordance with claim 7, wherein said nose includes a mounting portion which is enveloped by the point for securing the point to the digging edge, and wherein said bearing face extends in a direction away from said T-shaped coupling structure to a position beyond said

25 mounting portion of said nose.

9. A wear assembly in accordance with claim 6, further including a deflector fixed to the digging edge spaced rearward of said boss such that expansion means is positionable between said deflector and said adapter for moving

30 said adapter forwardly along said boss.

10. A wear member for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear member comprising a rear mounting end and a forwardly projecting working end, said mounting end including a leg adapted to extend rearwardly over the digging edge, said leg having an inner surface adapted to face the digging edge and a T-shaped coupling structure extending longitudinally along said inner surface for coupling to a boss fixed to the digging edge, a bearing face in communication with said T-shaped coupling structure and extending transversely to said T-shaped coupling structure in a direction generally away from said T-shaped coupling structure to a position beyond said inner surface at least approximately as far as the extension of said working end in the same direction whereby said bearing face is adapted to

45 abut a front end of the boss, and a lock receiving opening extending through said leg in communication with said T-shaped coupling structure, said opening including a pair of longitudinal side walls, one of said side walls including a keeper for releasably retaining a lock.

50 11. A wear member in accordance with claim 10, in which said working end includes a nose for mounting a point of an excavating tooth.

12. A wear member in accordance with claim 11, in which said nose has a longitudinal axis and said bearing face is substantially perpendicular to said longitudinal axis.

55 13. A wear member in accordance with claim 12, in which said mounting end includes only a single rearwardly extending leg.

14. A wear member in accordance with claim 10, in which said mounting end includes only a single rearwardly extending leg.

60 15. A wear member in accordance with claim 10, in which said working end has a longitudinal axis and said bearing face is substantially perpendicular to said longitudinal axis.

16. A wear member in accordance with claim 10, in which said T-shaped coupling structure is a T-shaped slot.

17. A wear member in accordance with claim 10, in which said opening has a generally T-shaped configuration with a

stem portion that extends longitudinally and opens in a rear end of said leg and a cross portion which extends laterally a greater distance the said stem portion.

18. A wear member in accordance with claim 10, in which said other f said pair of opening side walls is arcuated to form a pivot support for the lock.

19. A wear member in accordance with claim 10, in which said keeper includes a tab which overlies a recess in said one side wall.

20. A wear member for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear member comprising a rear mounting end and a forwardly projecting working end having a longitudinal axis, said mounting end including a leg adapted to extend rearwardly over the digging edge, said leg having a longitudinal axis which is inclined relative to said longitudinal axis of said working end, said leg having an inner surface adapted to face the digging edge and a T-shaped coupling structure extending longitudinally along said inner surface for coupling to a boss fixed to the digging edge, a bearing face extending transversely to said T-shaped coupling structure and substantially perpendicular to the longitudinal axis of said working end whereby said bearing face is adapted to abut a front end of the boss, and a lock receiving opening extending through said leg and in communication with said T-shaped coupling structure.

21. A wear member in accordance with claim 20, in which said working end includes a nose for mounting a point of an excavating tooth.

22. A wear member in accordance with claim 21, in which said bearing face extends beyond said nose in a direction away from said T-shaped coupling structure.

23. A wear member in accordance with claim 20, in which said working end is formed by tapering walls having rearward ends proximate said mounting end, and said bearing face extends in a direction away from said T-shaped coupling structure to a position beyond said rearward ends of said tapering walls.

24. A wear member in accordance with claim 20, in which said T-shaped coupling structure is a T-shaped slot.

25. A wear member in accordance with claim 20, in which said opening includes a pair of longitudinal walls, wherein one of said walls includes a keeper for releasably retaining a latch of a lock.

26. A wear member for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear member comprising a rear mounting end and a forwardly projecting working end, said mounting end including at least one leg adapted to extend rearwardly over the digging edge, said leg having an outer surface, an inner surface and a rear end wall, said inner surface being adapted to face said digging edge and having a T-shaped coupling structure for coupling to a boss fixed to the digging edge, and a lock receiving opening extending through said leg, said opening having a generally T-shaped configuration with a longitudinal stem portion opening in said rear end wall and a cross portion extending laterally beyond said stem portion.

27. A wear member in accordance with claim 26, in which said working end includes a nose for mounting a point of an excavating tooth.

28. A wear member in accordance with claim 26, in which said T-shaped coupling structure is a T-shaped slot.

29. A wear member in accordance with claim 26, in which one of said side walls of said opening includes a keeper for releasably retaining a latch of a lock.

30. A wear member in accordance with claim 29, in which said other of said pair of side walls of said opening is arcuated to form a pivot support for the lock.

31. A wear member in accordance with claim 29, in which said keeper includes a tab which overlies a recess in said one side wall.

32. A wear member in accordance with claim 26, in which said mounting end includes only a single rearwardly extending leg.

33. A wear member in accordance with claim 26, in which said mounting end includes a pair of rearwardly extending legs spaced apart to receive therebetween the digging edge.

34. A boss for attaching a wear member to a digging edge of an excavator, the digging edge having an inside face and an outside face, said boss comprising a first surface adapted to be fixed to the digging edge, and a second surface adapted to be positioned remote from the digging edge, said second surface having a longitudinally extending T-shaped coupling structure, said first surface having a clamping section adapted to wrap around the digging edge and engage front portions of the inside face and the outside face, and a front bearing face and a rear bearing face each extending between said first surface and said second surface.

35. A boss in accordance with claim 34, wherein said T-shaped coupling structure includes a body extending generally perpendicular to the digging edge and a lateral flange, and wherein said clamping section extends laterally beyond said body.

36. A boss in accordance with claim 35, in which said clamping section extends laterally beyond said flange.

37. A boss in accordance with claim 34, in which said front and rear bearing faces are generally planar.

38. A boss in accordance with claim 34, which further includes an opening extending from said first surface to said second surface to enable welding of said boss to the digging edge.

39. A boss in accordance with claim 34, in which said first surface includes a front segment and a rear segment, wherein said front segment extends at an inclination to said rear segment to engage a beveled ramp on the inside face of the digging edge.

40. A boss for attaching a wear member to a digging edge of an excavator, the digging edge having an inside face, an outside face and a beveled ramp, said boss comprising a first surface adapted to be fixed to the digging edge and a second surface adapted to be positioned remote from the digging edge, said first surface having a rear segment and a front segment inclined relative to one another, said front segment being adapted to be fixed to the beveled ramp of the digging edge, said second surface having a longitudinally extending T-shaped coupling structure, and a front bearing surface and a rear bearing face each extending between said first surface and said second surface.

41. A lock member for securing a wear member to a boss wherein the boss is fixed to a digging edge of an excavator, said lock member comprising a block shaped body having a rigid construction and including front and rear faces and a pair of side faces, one of said side faces including a latch adapted to cooperate with a keeper for retaining said lock member in a opening of the wear member, and an adjustment assembly having a longitudinal axis and extending through said body generally orthogonally to said front and rear faces, said adjustment assembly having a front bearing face that is axially movable to eliminate any looseness existing between the boss and the wear member.

42. A lock member in accordance with claim 41, in which said adjustment assembly includes a threaded bore extending through said body and a threaded plug operatively received into said bore, wherein said plug includes said front bearing face.

43. A lock member in accordance with claim 42, in which said plug further includes a plurality of flats to facilitate turning in said bore.

44. A lock member in accordance with claim 41, in which said adjustment assembly includes a bore extending substantially through said body and a piston axially movable in said bore under fluid pressure, wherein said piston includes said front bearing face.

45. A lock member in accordance with claim 41, in which the other of said side faces includes an arcuated depression which forms a pivot support.

46. A lock member in accordance with claim 41, in which said latch includes a rigid tang projecting outward from said one side face and an elastomeric member resiliently supporting said tang. 5

47. A method of removing a wear member from a boss fixed to a digging edge of an excavator, said method comprising:

providing a wear assembly including a boss fixed to the digging edge of an excavator, a deflector fixed to the digging edge rearward of said boss, a wear member, and a lock member, said boss and said wear member including complementary T-shaped structures coupled together to releasably hold said wear member to said boss, and said lock member preventing removal of said wear member from said boss when installed; 10

removing said lock member from said wear assembly;

providing an expansive force between said wear member and said deflector to force said wear member forwardly along said T-shaped structure of said boss; and 20

removing said wear member from said boss.

48. A method in accordance with claim 47, wherein said lock member includes an adjustment assembly which is selectively movable, and wherein said adjustment assembly of said lock member is used to apply said expansive force. 25

49. A method in accordance with claim 48, wherein said adjustment assembly includes a piston which is advanced under fluid pressure to move said wear member. 30

50. A method in accordance with claim 48, wherein said adjustment assembly includes a threaded plug which is advanced to move said wear member.

51. A wear assembly for attachment to a digging edge of an excavator comprising: 35

a wear member having a rearwardly extending leg and a forwardly projecting working end, said leg having a longitudinal slot which opens in an inner side of said leg, said slot having an internal shoulder, and an opening extending through said leg and in communication with said slot, said opening including a bearing face; 40

a boss adapted to be fixed to the digging edge, said boss including a bearing face and a longitudinal tongue, said tongue being axially received into said slot of said wear member and including a shoulder to engage said internal shoulder of said slot to prevent relative movement between said wear member and said boss in directions other than longitudinal; and 45

a rigid lock received into said opening and including a first face engaged with said bearing face of said 50

opening, a second face engaged with said bearing face of said boss, and an adjustment assembly selectively movable to vary the relative positions of said first and second faces to eliminate looseness which may exist in mounting said wear member to the digging edge.

5 52. A wear member for attachment to a boss fixed to a digging edge of an excavator, said wear member comprising a forwardly projecting working end having a longitudinal axis and a rearwardly extending leg inclined relative to the longitudinal axis of said working end, said leg having a longitudinal slot which opens in an inner side of said leg and a lock receiving opening extending through said leg and in communication with said slot, said slot having an internal shoulder and being adapted to receive a complementary tongue of a boss to prevent relative movement therebetween in directions other than longitudinal, said wear member further including a first bearing face in said opening to engage a lock and a second bearing face exposed in said slot to engage the boss, said second bearing face extending transversely to said slot and substantially perpendicular to said longitudinal axis of said working end.

53. A wear member for attachment to a boss fixed to a digging edge of an excavator, said wear member comprising a forwardly projecting working end and a rearwardly extending leg, said leg having a longitudinal slot which opens in an inner side of said leg and a lock receiving opening extending through said leg and in communication with said slot, said slot having an internal shoulder and being adapted to receive a complementary tongue of a boss to prevent relative movement therebetween in directions other than longitudinal, said wear member further including a first bearing face in said opening adapted to engage a lock and a second bearing face exposed in said slot adapted to engage the boss, said second bearing face being generally transverse to said slot and projecting outward from said slot at least approximately as far as the extension of said working end in the same direction.

54. A wear member for attachment to a boss fixed to a digging edge of an excavator, said wear member comprising a forwardly projecting working end and a rearwardly extending leg having a transverse rear end wall said leg having a longitudinal slot which opens in an inner side of said leg and said rear end wall, and a lock receiving opening extending through said leg and in communication with said slot, said slot having an internal shoulder and being adapted to receive a complementary tongue of a boss to prevent relative movement therebetween in directions other than longitudinal, and said opening being open in said rear end wall including a lateral shoulder in said leg spaced from said rear end wall to define a bearing surface for a lock to secure the wear member to the boss.

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55. A wear assembly for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear assembly comprising:  
a boss having a mounting surface adapted to be fixed to the digging edge, a T-shaped coupling structure, and a bearing face extending transverse to said mounting surface;

a wear member having at least one rearwardly extending leg and a forwardly projecting working end, said leg having a T-shaped coupling structure releasably coupled to said T-shaped structure of said boss, and an opening extending therethrough; and

a lock received into said opening to hold said wear member to said boss, said lock having a first face adapted to oppose said bearing face of said boss and a second face adapted to oppose a wall of said opening, whereby said lock further includes an adjustment assembly selectively movable to vary the relative positions of said first and second faces.

56. A wear assembly in accordance with claim 55 in which said opening has a generally T-shaped configuration with a stem portion that extends longitudinally and opens in a rear end of the leg of the wear member, and a lateral cross portion which includes said wall to oppose the lock.

57. A wear assembly in accordance with claim 55 in which the adjustment assembly includes a threaded member which is turned to adjust the relative spacing between the first face and the second face.

58. A wear assembly in accordance with claim 55 in which the wear member includes a keeper structure in the opening, and the lock includes a projection received in

the keeper structure to hold the lock in the opening.

59. A wear assembly for attachment to a digging edge of an excavator, the digging edge having an inside face and an outside face, said wear assembly comprising:  
a boss having a mounting surface adapted to be fixed to the digging edge, a T-shaped coupling structure, and a bearing face extending laterally to said mounting surface;  
a wear member having at least one rearwardly extending leg and a forwardly projecting working end, said leg having a T-shaped coupling structure releasably coupled to said T-shaped structure of said boss, and an opening extending therethrough; and  
a lock received into said opening to hold said wear member to said boss, said lock having a first part with a first face adapted to oppose <sup>and engage</sup> said bearing face of said boss, and  
a second part with a second face adapted to oppose a wall of said opening, said first part being threadedly connected to said second part for adjustment of said first face relative to said second face.

60. A wear assembly in accordance with claim 59 in which said opening has a generally T-shaped configuration with a stem portion that extends longitudinally and opens in a rear end of the leg of the wear member, and a lateral cross portion which includes said wall to oppose the lock.

61. A wear assembly in accordance with claim 59 in which the wear member includes a keeper structure in the opening, and the lock includes a projection received in the keeper structure to hold the lock in the opening.

62. A mount for attaching a wear member to a digging edge of an excavator, the digging edge having an inside face and an outside face, said mount comprising a rear structure having a mounting surface adapted to be fixed to the digging edge, a



longitudinally extending T-shaped coupling structure adapted to mate with a complementary formation of the wear member, and a rearwardly facing bearing surface adapted to abut a lock and thereby hold the wear member to the mount, and a front structure adapted to wrap around the digging edge and be attached to front portions of the inside face and the outside face, said front structure including at least one surface adapted to abut the wear member and resist unwanted movement of the wear member relative to the mount.

63. A mount in accordance with claim 62 in which the front structure is wider than the mounting surface of the rear structure.

64 A mount in accordance with claim 63 in which the T-shaped coupling structure includes a lateral flange, and the front structure is wider than the lateral flange.

65. A mount in accordance with claim 63 in said at least one surface of the front structure faces forwardly to abut an inner surface of the wear member.

66. A mount in accordance with claim 63 wherein the rear and front structures are formed as a one-piece member.

67. A lock adapted to be received into an opening in a wear member for securing the wear member to a boss fixed to a digging edge of an excavator, said lock comprising opposite front and rear bearing faces wherein the front face is adapted to oppose the boss and the rear face is adapted to oppose the wear member to maintain the coupling of the wear member to the boss, an adjustment assembly for selectively varying the relative positions of the front and rear bearing faces, and a projection to cooperate with a keeper structure to hold the lock in the opening in the wear member.

68. A lock in accordance with claim 67 in which the adjustment assembly

includes a threaded bore extending through the body and a threaded plug operatively received into the bore, wherein the plug includes the front bearing face.

69. A lock in accordance with claim 67 in which the body includes an arcuate depression in a side thereof to form a pivot support.

70. A lock in accordance with claim 67 in which the projection includes a rigid tang and a elastomeric member resiliently supporting the tang.

71. A method of mounting a wear member to an excavator provided with a boss having a first longitudinal T-shaped coupling member, the wear member having a front working structure and at least one rearwardly extending leg formed with a second longitudinal T-shaped coupling structure and an opening in communication with the second T-shaped coupling structure, the method comprising:

sliding the wear member rearwardly onto the boss so that the first and second T-shaped coupling structures mate with each other;

inserting a lock with opposite, spaced apart first and second bearing faces into the opening such that the first bearing face opposes a wall of the boss and the second bearing face opposes a wall of the wear member;

selectively adjusting the spacing between the first and second bearing faces to tighten the mounting of the wear member onto the excavator.

72. A method in accordance with claim 71 in which the lock includes a threaded member which includes the first bearing face on one end, wherein the adjusting of the space between the bearing faces is accomplished by turning of the threaded member.

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